VIPER®

Responder LC Model 5501
Remote Start Keyless Entry
Installation Guide

This product is intended for installation by a professional installer only! Attempts to install this product by a person other than a trained professional may result in severe damage to a vehicle's electrical system and components.

Directed® ELECTRONICS

© 2008 Directed Electronics, Vista, CA
N4702V 2008-08

Bitwriter®, Code Hopping™, Doubleguard®, ESP™, Fail-Safe®, Ghost Switch™, Learn Routine™, Nite-Lite®, Nuisance Prevention® Circuitry, Revenger®, Silent Mode™, Soft Chirp®, Stinger®, Valet®, Vehicle Recovery System®, VRS®, and Warn Away® are all Trademarks or Registered Trademarks of Directed Electronics.

The Bitwriter® (p/n 998U) requires chip version 2.6 or newer to program this unit.

Bitwriters with date code of 6A or older require an IC upgrade (p/n 998M). Some Bitwriters with a date code of 6B do not require the IC upgrade. Refer to Tech Tip # 1112 for more information. Bitwriter 2 compatible.

D2D DATA TO DATA

Contents

Warning! Safety first 5
What is included.....7
Installation points to remember.....7
- Virtual tach 7
- D2D.....8
- The control center 8
- Valet® program switch 9
- Status LED.....9
- Before beginning the installation.....10
- After the installation 10

Component location and finding wires.....11
Making your wiring connections 11
- Primary harness (H1), 12-pin connector.....12
- Auxiliary harness (H2), 7-pin connector.....12
- Heavy gauge remote start, (H3) 8-pin connector.....13
- Remote start input, 5-pin connector 13
- Remote start auxiliary output, 5-pin 14
- Door lock harness, 3-pin connector 14

Wire connection guides.....15
- Primary harness (H1).....15
- Auxiliary harness (H2).....21
- Heavy Gauge, 8-pin connector.....25
- Remote start input - 5-pin connector.....27
- Remote start auxiliary output, 5-pin 29
- Door lock wire diagrams 30

Neutral safety switch interface 31
- Testing the neutral safety switch 31

Plug-in LED and valet/program switch.....32
Bitwriter interface - 3-pin black plug 32
Tachometer settings 33
- Virtual tach 33
- Tach learning 34

D2D Jumper settings.....35
Setting the light flash polarity.....36
Remote control Learn Routine™.....37
Remote control configuration 40
- Responder LC 2-way 40

System features learn routine 42
Feature menus 45
- Menu 1 - Keyless entry 45
- Menu 2 - Convenience 46
- Menu 3 - Remote start 47

Feature descriptions....48
Menu 1 - Keyless entry....48
Menu 2 - Convenience....50
Menu 3 - Remote start....53
Bitwriter®....56
Additional system features....57
Shutdown diagnostics....58
Remote starting diagnostics....59
Remote start safety check....60
Troubleshooting....61
Keyless entry system....61
Remote start....61

⚠ Warning! Safety first

The following safety warnings must be observed at all times:

- Due to the complexity of this system, installation of this product must only be performed by an authorized Directed Electronics dealer.
- When properly installed, this system can start the vehicle via a command signal from the remote control. Therefore, never operate the system in an area that does not have adequate ventilation.

The following precautions are the sole responsibility of the user; however, authorized Directed Electronics dealers should:

- **Never use a test light or logic probe when installing this unit. Always use a multimeter.**
- Never operate the system in an enclosed or partially enclosed area without ventilation (such as a garage).
- When parking in an enclosed or partially enclosed area or when having the vehicle serviced, the remote start system must be disabled using the installed toggle switch. It is the user's sole responsibility to properly handle and keep out of reach from children all remote controls to assure that the system does not unintentionally remote start the vehicle.

  USER MUST INSTALL A CARBON MONOXIDE DETECTOR IN OR ABOUT THE LIVING AREA ADJACENT TO THE VEHICLE. ALL DOORS LEADING FROM ADJACENT LIVING AREAS TO THE ENCLOSED OR PARTIALLY ENCLOSED VEHICLE STORAGE AREA MUST REMAIN CLOSED AT ALL TIMES.

Use of this product in a manner contrary to its intended mode of operation may result in property damage, personal injury, or death. Except when performing the Safety Check outlined in this installation guide, (1) Never remotely start the vehicle with the vehicle in gear, and (2) Never remotely start the vehicle with the keys in the ignition. The user will be responsible for having the neutral safety feature of the vehicle periodically checked, wherein the vehicle must not remotely start while the car is in gear. This testing should be performed by an authorized Directed Electronics dealer in accordance with the Safety Check outlined in this product installation guide. If the vehicle starts in gear, cease remote start operation immediately and consult with the user to fix the problem immediately.

© 2008 Directed Electronics. All rights reserved.

After the remote start module has been installed, test the remote start module in accordance with the Safety Check outlined in this installation guide. If the vehicle starts when performing the Neutral Safety Shutdown Circuit test, the remote start unit has not been properly installed. The remote start module must be removed or properly reinstalled so that the vehicle does not start in gear. All installations must be performed by an authorized Directed Electronics dealer.

OPERATION OF THE REMOTE START MODULE IF THE VEHICLE STARTS IN GEAR IS CONTRARY TO ITS INTENDED MODE OF OPERATION. OPERATING THE REMOTE START SYSTEM UNDER THESE CONDITIONS MAY RESULT IN PROPERTY DAMAGE OR PERSONAL INJURY. IMMEDIATELY CEASE THE USE OF THE UNIT AND REPAIR OR DISCONNECT THE INSTALLED REMOTE START MODULE. DIRECTED ELECTRONICS, INC. WILL NOT BE HELD RESPONSIBLE OR PAY FOR INSTALLATION OR REINSTALLATION COSTS.

Remote starters for manual transmission pose significant risks if not properly installed and operated. When testing to ensure the installation is working properly, only remote start the vehicle in neutral gear, on a flat surface and with a functional, fully engaged parking brake. Do not allow anyone to stand in front of or behind the vehicle.

This product should **not** be installed in any convertible vehicles, soft or hard top with a manual transmission. Installation in such vehicles may pose certain risk.

© 2008 Directed Electronics. All rights reserved.

What is included

- The control module
- Control center with integrated status LED and Valet Override switch N6711T
- One five-button, 2-way Supercode Responder LC Remote Control (p/n 7752V)
- One five-button, 1-way Supercode Remote (p/n 7652V)
- A shut-down toggle switch

Installation points to remember

This product is designed for fuel-injected, automatic transmission, or vehicles with manual transmissions.

> **Important!** The default option "Manual" is a safety precaution that forces the installer to enable the Manual Transmission Start (MTS) routine or program the unit to the "Automatic" option before the remote start can be activated for the first time.

The "Automatic" option should be programmed on to work with automatic transmissions. When the "Manual" option is selected a specific routine is required before exiting the vehicle to enable the MTS mode.

➤ Virtual tach

Virtual Tach is a new feature for Directed this year. It is the default RPM-sensing method for the new Responder LC hybrid keyless entry/remote start systems.

Virtual Tach gives the installer the performance of a hard wired tach, with the convenience of voltage sensing. It is far superior to any voltage-sense feature you've tried before.
Virtual Tach monitors the cranking voltage of the vehicle using a very fast micro controller and an analog-to-digital converter. The microprocessor "saves" the base voltage as a reference. When Virtual Tach "sees" the slightest uptick in voltage, indicating that the alternator is charging the battery, the starter motor shuts off instantly.

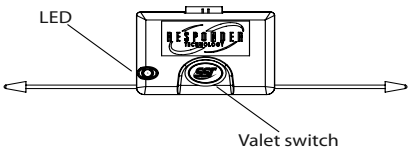
© 2008 Directed Electronics. All rights reserved.

➤ D2D

The system has the ability to interface with an XK module through the D2D port. The advantage to using a D2D interface is that there is less wiring involved in the installation. Check the XK module installation guide to determine which wires are not needed, and which options are available.

➤ The control center

The control center position should be discussed with the vehicle's owner prior to installation. The LED and Valet switch is housed on the control center, so you will want to make sure that the customer is satisfied with the location.



© 2008 Directed Electronics. All rights reserved.

➤Valet® program switch

The valet/program switch is built into the control center.

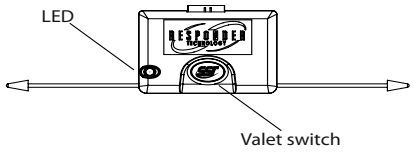
> **Important:** When the vehicle is delivered, please show the user where this switch is located and how to disarm the system with it.

Note: An optional valet switch (p/n #8631) is available if the onboard valet switch is not used for the install.

When installing the external valet switch ensure that the location has sufficient clearance to the rear. The switch should be well hidden. It should be placed so passengers or stored items (such as in a glove box or center console) cannot accidentally hit it. The switch fits into a 9/32-inch hole.

➤ Status LED

The status LED is built into the control center. An optional LED (p/n 8634) is available if the onboard LED will not be used for the install. The LED fits into a 9/32-inch hole.



© 2008 Directed Electronics. All rights reserved.

➤ Before beginning the installation

- Please read this entire installation guide before beginning the installation. The installation of this remote start system requires interfacing with many of the vehicle's systems. Many new vehicles use low-voltage or multiplexed systems that can be damaged by low resistance testing devices, such as test lights and logic probes (computer safe test lights). Test all circuits with a high quality digital multi-meter before making connections.
- Do not disconnect the battery if the vehicle has an anti-theft-coded radio. If equipped with an air bag, avoid disconnecting the battery if possible. Many airbag systems will display a diagnostic code through their warning lights after they lose power. Disconnecting the battery requires this code to be erased, which can require a trip to the dealer.
- If using an external LED or Valet Switch, check with the customer about where to locate the switch.
- To avoid accidental battery drainage; turn off the interior lights or remove the dome light fuse.
- Roll down a window to avoid being locked out of the car.

➤ After the installation

- Test all functions. The Using Your System section of the Owner's Guide is very helpful when testing.

- Review and complete the Safety Check section of this guide prior to the vehicle reassembly.

© 2008 Directed Electronics. All rights reserved.

Component location and finding wires

For detailed information on where to locate components, and how to find the wires you need, please refer to the Directed web site at **www.directechs.com.**

Making your wiring connections

Before making your connections, plan how your wires will be routed through the vehicle. For instance, the red 12V constant input and the remote start ignition wires will often be routed together to the ignition switch harness. In order to keep the wiring neat and make it harder to find, you may wish to wrap these wires together in electrical tape or conceal them in tubing similar to what the manufacturer used.

There are two acceptable ways of making a wire connection - solder connections and crimp connectors. When properly performed, either type of connection is reliable and trouble-free. Regardless of whether you solder your connections or you use mechanical type crimp-on connections, ensure that all connections are mechanically sound and that they are insulated, especially when connecting data lines in the vehicle.

Cheap electrical tape, especially when poorly applied, is not a reliable insulator. It often falls off in hot weather. Use good quality electrical tape or heat shrink.

- Never twist-and-tape the wires together without soldering.
- Never use "fuse taps", as they can damage fuse box terminals.

If you use tapping connectors such as T-Taps (not to be confused with Scotch-Locks), avoid using them in higher-current applications (constant 12V, ground, etc.) These connectors are inferior in quality and should be avoided.

© 2008 Directed Electronics. All rights reserved.

➤ Primary harness (H1), 12-pin connector

H1/1	RED/WHITE	(-) 200mA TRUNK RELEASE OUTPUT
H1/2	RED	(+)12v CONSTANT INPUT
H1/3	BROWN	(-) HORN OUTPUT
H1/4	WHITE/BROWN	LIGHT FLASH ISOLATION WIRE - PIN 87a of onboard relay
H1/5	BLACK	(-) CHASSIS GROUND
H1/6	VIOLET	(+) DOOR TRIGGER INPUT (See Note on pg. 17)
H1/7	BLUE	(-) FACTORY HORN INPUT
H1/8	GREEN	(-) DOOR TRIGGER INPUT (See Note on pg. 18)
H1/9	BLACK/WHITE	(-) 200mA DOME LIGHT OUTPUT
H1/10	WHITE/BLUE	(-) REMOTE START/ TURBO TIMER ACTIVATION INPUT
H1/11	WHITE	PARKING LIGHT OUTPUT
H1/12	ORANGE	(-) 500mA GROUND WHEN ARMED OUTPUT

➤ Auxiliary harness (H2), 7-pin connector

H2/1	LIGHT GREEN/ BLACK	(-) 200mA FACTORY ALARM DISARM OUTPUT
H2/2	LIGHT GREEN/ WHITE	(-) 200mA FACTORY ALARM ARM OUTPUT
H2/3	WHITE/VIOLET	(-) 200mA AUX 1 OUTPUT
H2/4	VIOLET/BLACK	(-) 200mA AUX 2 OUTPUT
H2/5	WHITE/BLACK	(-) 200mA AUX 3 OUTPUT
H2/6	LIGHT BLUE	(-) 200mA 2ND UNLOCK OUTPUT
H2/7	GRAY/BLACK	(-) DIESEL WAIT TO START INPUT

© 2008 Directed Electronics. All rights reserved.

There are three harness connections relative to remote start function, including the heavy gauge and input and output harnesses.

➤ Heavy gauge remote start, (H3) 8-pin connector

H3/1	PINK	(+) IGNITION 1 INPUT/OUTPUT
H3/2	RED/WHITE	(+) FUSED (30A) IGNITION 2 / FLEX RELAY INPUT 87
H3/3	ORANGE	ACCESSORY OUTPUT
H3/4	VIOLET	STARTER OUTPUT
H3/5	RED	(+) FUSED (30A) IGNITION 1 INPUT
H3/6	PINK/WHITE	IGNITION 2 / FLEX RELAY OUTPUT 30
H3/7	PINK/BLACK	FLEX RELAY INPUT 87A key side (if required) of FLEX RELAY
H3/8	RED/BLACK	(+) FUSED (30A) ACCESSORY/STARTER INPUT

➤ Remote start input, 5-pin connector

1	BLACK/WHITE	(-) NEUTRAL SAFETY SWITCH INPUT
2	VIOLET/WHITE	TACHOMETER INPUT
3	BROWN	(+) BRAKE SHUTDOWN INPUT
4	GRAY	N/O or N/C (-) HOOD PIN SWITCH INPUT
5	BLUE/WHITE	(-) 200 mA 2ND STATUS/REAR DEFOGGER OUTPUT

© 2008 Directed Electronics. All rights reserved.

➤ Remote start auxiliary output, 5-pin

1	PINK/WHITE	(-) 200mA FLEX RELAY CONTROL OUTPUT
2	ORANGE	(-) 200mA ACCESSORY OUTPUT
3	VIOLET	(-) 200mA STARTER OUTPUT
4	PINK	(-) 200mA IGNITION 1 OUTPUT
5	BLUE	(-) 200mA STATUS OUTPUT

Note: Wires 1 - 4 on the remote auxiliary outputs are wired to the (-) triggers for the onboard remote start relays and are not diode isolated. If connecting these wires directly to the vehicle you must place a 1-amp diode in line to prevent feedback from the vehicle.

➤ Door lock harness, 3-pin connector

1	BLUE	(+) LOCK (-) UNLOCK OUTPUT
2	EMPTY	NOT USED
3	GREEN	(-) LOCK (+) UNLOCK OUTPUT

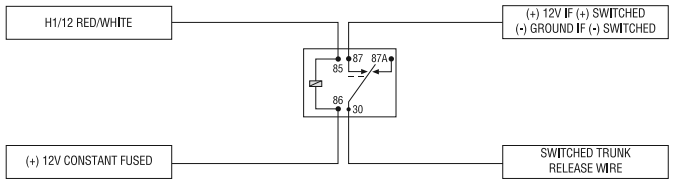
© 2008 Directed Electronics. All rights reserved.

Wire connection guides

➤ Primary harness (H1)

H1/1	RED/WHITE	(-) 200mA TRUNK RELEASE OUTPUT

When the system receives the code controlling trunk release output for longer than 1.5 seconds, the red/white wire will supply an output as long as the transmission continues. This is typically used to operate a trunk/hatch release or other relay-driven function.



Warning! Never use this wire to drive anything but a relay or a low-current input, supplied output is only 200mA. Connecting directly to a solenoid, motor, or other high-current device will cause the module to fail.

H1/2	RED	(+)12v CONSTANT INPUT

Before connecting this wire, remove the supplied fuse. Connect to the battery positive terminal or the constant 12V supply to the ignition switch.

Note: Always use a fuse within 12 inches of the point you obtain (+)12V. Do not use the 15A fuse in the harness for this purpose. This fuse protects the module.

© 2008 Directed Electronics. All rights reserved.

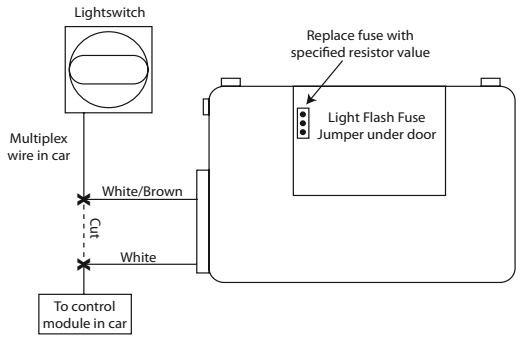
H1/3	BROWN	(-) HORN OUTPUT

This wire supplies a (-) 200 mA output that can be used to honk the vehicle horn. It outputs a single pulse when locking the doors with the remote, and two pulses when unlocking with the remote. This wire also outputs pulses for 30 seconds when Panic Mode is activated. If the vehicle has a (+) horn circuit, an optional relay can be used to interface with the system.

H1/4	WHITE/BROWN	LIGHT FLASH -ISOLATION WIRE - PIN 87a of onboard relay

This wire connects to pin 87a of the onboard light flash relay. It is used whenever light switch isolation on the vehicle is necessary. If the vehicle has a multiplex circuit that needs the light switch isolated, you can remove the onboard light flash fuse and replace it with the specified resistor (paying attention to the polarity selection).

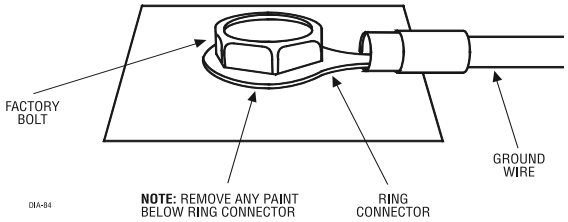
Multiplex Lightflash Interface



© 2008 Directed Electronics. All rights reserved.

H1/5	BLACK	(-) CHASSIS GROUND

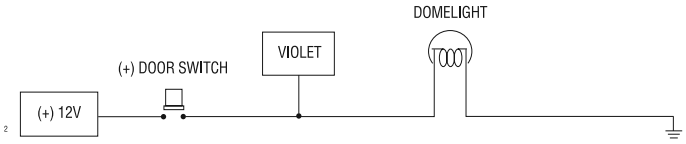
We recommend that you do not use a factory ground. Ground all your components to the same point in the vehicle, (preferably the kick panel). Scrape away any paint and use a factory bolt or make your own ground with a self-tapping screw and a star washer.



H1/6	VIOLET	(+) DOOR TRIGGER INPUT*

This wire is used in vehicles that have a positive (+) switched dome light circuit. Connect the violet wire to a wire that shows (+)12V when any door is opened, and ground when the door is closed.

*Door trigger input is needed if one of the following are used: MTS, passive arming, auto re-locking, door ajar error honk or Smart Key control.

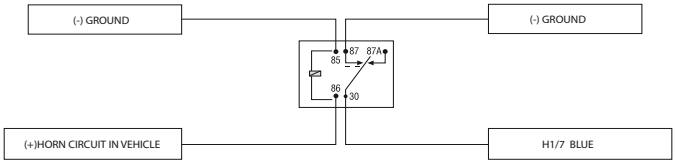


© 2008 Directed Electronics. All rights reserved.

H1/7	BLUE	FACTORY HORN INPUT

This optional input can be wired to the factory horn honk output of the vehicle. When this wire receives an input for a minimum of .5 seconds, the system reports a trigger on the remote. This is useful on vehicles that have a factory security system, it notifies the owner that the system was triggered.

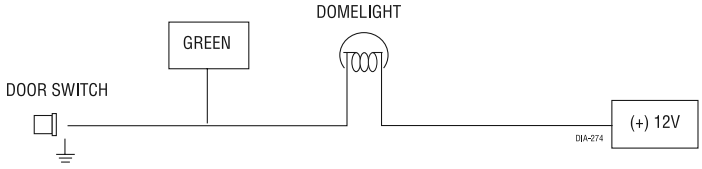
Note: The system does not report that a zone has been triggered when unlocking with the remote. Connect to the wire in the vehicle that shows voltage when the factory alarm system is triggered. If the vehicle has a (+) horn circuit, an optional relay can be used to interface with the system, as shown below.



H1/8	GREEN	(-) DOOR TRIGGER INPUT

Most vehicles use negative door trigger circuits. Connect the green wire to a wire which shows ground when any door is opened. In vehicles with factory delays on the dome light circuit, there is usually a wire that is unaffected by the delay circuitry.

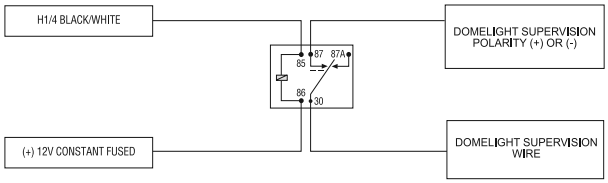
Note: *Door trigger input is needed when one of the following are used: MTS, passive arming, auto re-locking, door ajar error honk or Smart Key control.



© 2008 Directed Electronics. All rights reserved.

H1/9	BLACK/WHITE	(-) 200mA DOME LIGHT OUTPUT

Connect this wire to the optional dome light supervision relay as shown below: Important! This output is only intended to drive a relay. It cannot be connected directly to the dome light circuit, as the output cannot support the current draw of one or more light bulbs.

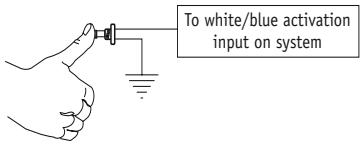


H1/10	WHITE/BLUE	(-) REMOTE START/ TURBO TIMER ACTIVATION INPUT

This input comes from the factory set to 1 activation pulse. This means that it is necessary to have a single ground pulse on the white/blue wire for the remote start to activate or to deactivate.

The H1/10 wire can also be used to activate the Turbo Timer mode when the car is running and this wire receives a ground.

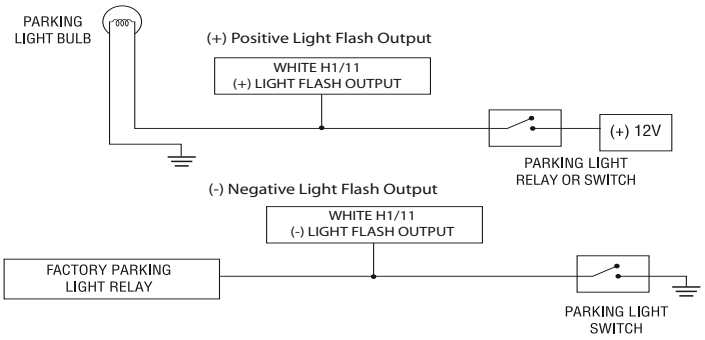
Note: The number of activation inputs can be programmed to 1 or 2 pulses with an optional momentary switch. This setting affects both the input wire and the remote control when operating the remote starter.



© 2008 Directed Electronics. All rights reserved.

H1/11	WHITE	PARKING LIGHT OUTPUT

This wire should be connected to the parking light wire in the vehicle. See Setting the light flash polarity section of this guide for polarity settings.



Note: For parking light circuits that draw 10-amps or more, the internal jumper must be switched to a (-) light flash output. (See Setting the light flash polarity section of this guide.) P/N 8617 or a standard automotive SPDT relay must be used on the H1/11 light flash output harness wire.

H1/12	ORANGE	(-) 500mA GROUND WHEN ARMED OUTPUT

This wire supplies a (-)500 mA ground as long as the system is locked and when the remote start is activated. (This feature can be turned off by programming the anti-grind option Off). This output ceases as soon as the system is unlocked. The GWA can be hooked up to an optional starter kill/anti-grind relay control module, a voice module or any accessory that requires a ground when armed.

Note: The one time bypass feature does not disable function.

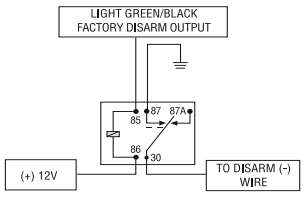
© 2008 Directed Electronics. All rights reserved.

➤ Auxiliary harness (H2)

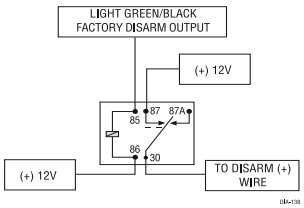
H2/1	LIGHT GREEN/BLACK	(-) 200mA FACTORY ALARM DISARM OUTPUT

This wire sends a negative pulse every time the remote start is activated, trunk release is activated (programmable on/off) or when the doors are unlocked with the remote. This can be used to pulse the disarm wire of the vehicle's factory anti-theft device. Use a relay to send a (-) or (+) pulse to the disarm wire as shown in the following diagrams.

Relay for Negative (-) Disarm Wire



Relay for Positive (+) Disarm Wire



H2/2	LIGHT GREEN/WHITE	(-) 200mA FACTORY ALARM ARM OUTPUT

This wire sends a negative pulse every time the remote start shuts down or when the doors are locked with the remote. This can be used to pulse the arm wire of the vehicle's factory anti-theft device. Use a relay to send a (-) or (+) pulse to the arm wire.

© 2008 Directed Electronics. All rights reserved.

H2/3	WHITE/VIOLET	(-) 200mA AUX 1 OUTPUT

This wire provides 200 mA programmable output whenever the transmitter button controlling Aux 1 channel is pressed. (See descriptions for Aux 3)

Warning! Never use this wire to drive anything but a relay or a low-current input, supplied output is only 200mA. Connecting directly to a solenoid, motor, or other high-current device will cause the module to fail.

H2/4	VIOLET/BLACK	(-) 200mA AUX 2 OUTPUT

This wire provides 200 mA programmable output whenever the transmitter button controlling Aux 2 channel is pressed. (See descriptions for Aux 3.)

Warning! Never use this wire to drive anything but a relay or a low-current input, supplied output is only 200mA. Connecting directly to a solenoid, motor, or other high-current device will cause the module to fail.

H2/5	WHITE/BLACK	(-) 200mA AUX 3 OUTPUT

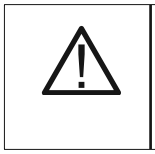
This wire provides 200 mA programmable output whenever the transmitter button controlling Aux 3 is pressed. This output can be programmed to provide the following types of outputs

- Validity: Output that sends a signal as long as the transmission is received.
- Latched: Output that sends a signal when the Aux channel button is pressed and continues until the same button is pressed.

© 2008 Directed Electronics. All rights reserved.

- Latched, reset with ignition: Similar to the latched output, this type of output turns On the first time the Aux channel button is pressed, and turns Off the next time the same button is pressed. This type of output additionally stops and resets whenever the ignition is turned On and then Off.
- 30 seconds timed: The output sends a continuous signal for 30 seconds.

  Note: Bitwriter® programs from 1 to 90 seconds.



Warning! Never use this wire to drive anything but a relay or a low-current input, supplied output is only 200mA. Connecting directly to a solenoid, motor, or other high-current device will cause the module to fail.

H2/6	LIGHT BLUE	(-) 200mA 2ND UNLOCK OUTPUT

This wire produces a (-) 200mA output for progressive locks in which the driver door unlocks first and the remaining locks will unlock with a second press of the unlock button on the remote.

Note: This feature will need to be programmed "On" to function correctly (see System Feature Menu #1, feature 8).

H2/7	GRAY/BLACK	(-) DIESEL WAIT TO START INPUT

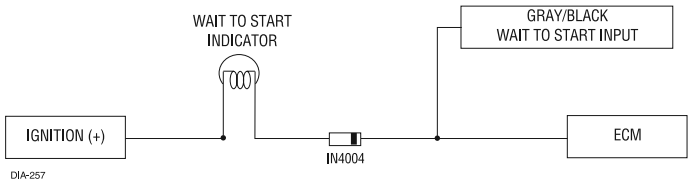
Connect this wire to the wire in the vehicle that sends the signal to turn on the WAIT-TO-START bulb in the dashboard. In most diesels the wire is negative (ground turns on the bulb) and the GRAY/BLACK wire can be directly connected to the wire in the vehicle. If the vehicle uses a positive wire (12V to turn on the bulb) a relay must be used to change the polarity.

The system has a programmable onboard timer (See Feature menu#3, feature 9) so it is not mandatory to connect to the wait-to-start wire in the vehicle.

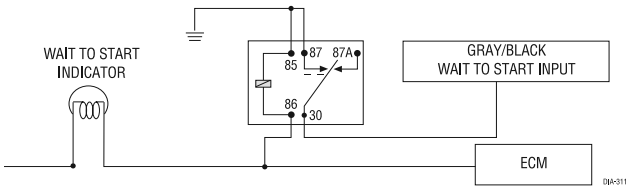
© 2008 Directed Electronics. All rights reserved.

Note: A 1-amp diode must be installed in line on the factory wire between the wait-to-start indicator and the ECM. (See the following diagram for details).

(-) WAIT TO START WIRE



(+)WAIT-TO-START WIRE



© 2008 Directed Electronics. All rights reserved.

➤ Heavy Gauge, 8-pin connector

There are 8 heavy gauge wires coming from the large 8-pin connector. They are used to energize the ignition circuits in the vehicle. It is crucial to ensure that these connections are capable of handling the current demands. For this reason, Scotch-Locks, T-taps and other such connectors are strongly discouraged.

H3/1	PINK	(+) IGNITION 1 INPUT/OUTPUT

Connect this wire to the ignition wire in the vehicle. This wire not only supplies voltage for the ignition line in the vehicle, it is also the ignition feed for the remote start system.

H3/2	RED/WHITE	(+) FUSED (30A) IGNITION 2 / FLEX RELAY INPUT 87

This wire is the polarity feed for the ignition 2/flex relay.

H3/3	ORANGE	ACCESSORY OUTPUT

Connect this wire to the accessory wire that powers the climate control system

H3/4	VIOLET	STARTER OUTPUT

Connect this wire to the starter wire in the vehicle.

H3/5	RED	(+) FUSED (30A) IGNITION 1 INPUT

This wire is the polarity feed for the Ignition 1 relay.

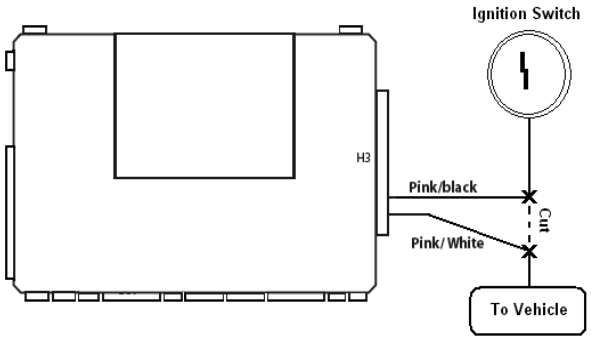
H3/6	PINK/WHITE	IGNITION 2 / FLEX RELAY OUTPUT 30

This wire is factory programmed as Ignition 2 and can be programmed as a 2nd accessory or 2nd starter.

© 2008 Directed Electronics. All rights reserved.

H3/7	PINK/BLACK	FLEX RELAY INPUT 87A key side (if required) of FLEX RELAY

This wire is used when an ignition switch isolation on the vehicle is necessary. This is common on Toyota and Nissans which required the use of Tech Tip document #1077. (See menu # 3 Feature 8 for programming options) See the diagram below for more wiring detail.)



H3/8	RED/BLACK	(+) FUSED (30A) ACCESSORY/STARTER INPUT

This wire is the polarity feed to the accessory and starter relays.

© 2008 Directed Electronics. All rights reserved.

➤ Remote start input - 5-pin connector

1	BLACK/WHITE	(-) NEUTRAL SAFETY SWITCH INPUT

Connect this wire to a ground source if installing this unit in an automatic transmission vehicle. If this unit is being installed in a manual transmission vehicle then connect it to the emergency brake wire. This input MUST rest at ground in order for the remote start system to operate.
Important! Always perform the steps outlined in Safety Check section to verify that the vehicle cannot be started in ANY drive gear and that the override switch is functioning properly.

2	VIOLET/WHITE	TACHOMETER INPUT WIRE

This input provides the module with information about the engine's revolutions per minute (RPMs). It can be connected to the uncommon colored wire of the fuel injector, the crankshaft position sensor, the camshaft position sensor or the negative side of the coil in vehicles with conventional coils. In multi-coil and high energy ignition systems locating a proper signal may be more difficult. (See Finding the Wires You Need section of this guide.) Once connected, you must teach the system the tach signal.

Note: This wire MUST be used when installing this unit on a manual transmission vehicle.

3	BROWN	(+) BRAKE SHUTDOWN WIRE

This wire MUST be connected to the vehicle's brake light wire. This is the wire that shows (+) 12V when the brake pedal is depressed. The remote start is disabled or shut down when the brake pedal is depressed.

> **Important:** This wire MUST be used when installing this unit on a manual transmission vehicle.

© 2008 Directed Electronics. All rights reserved.

4	GRAY	N/O or N/C (-) HOOD PIN SWITCH INPUT

This wire MUST be connected to a hoodpin switch. This input will disable or shut down the remote start when the hood is opened.

(See Feature Descriptions, Menu #1 feature 11 for details about programming.)

5	BLUE/WHITE	(-) 200 mA 2ND STATUS/REAR DEFOGGER

This wire supplies a 200mA output as soon as the module begins the remote start process. The Blue/White wire can also be used to activate the defogger trigger (latched/pulsed) 10-seconds after the remote start engages. (See the Feature Descriptions, Menu#3, feature 11 for details about programming this output.)

© 2008 Directed Electronics. All rights reserved.

➤ Remote start auxiliary output, 5-pin

These signals are provided to drive additional optional relays.

1	PINK/WHITE	(-) 200mA FLEX RELAY CONTROL OUTPUT

This wire is programmed as (-) 2nd ignition output from factory and can be programmed (to drive a relay) as a (-) starter or an accessory output. (See Feature programming Menu 3, Feature 8.)

2	ORANGE	(-) 200mA ACCESSORY OUTPUT

This wire works like the main accessory wire and can be used (with a relay) to drive any additional accessory circuits in the vehicle.

3	VIOLET	(-) 200mA STARTER OUTPUT

This wire works like the starter wire and can be used (with a relay) to drive any additional starter circuits in the vehicle.

4	PINK	(-) 200mA IGNITION 1 OUTPUT

This wire works like the ignition 1 wire and can be used (with a relay) to drive any additional ignition circuits in the vehicle.

Note: Wires 1 - 4 on the remote start auxiliary outputs are wired to the (-) triggers for the onboard remote start relays and are not diode isolated. If connecting these wires directly to the vehicle you must place a 1-amp diode in line to prevent feedback from the vehicle.

5	BLUE	(-) 200mA STATUS OUTPUT

This wire supplies an output as soon as the module begins the remote start process. It can be used to activate a bypass module or power the key sense wire in most vehicles to disarm the factory alarm without unlocking.
Note: Check vehicle information to verify if a bypass module is needed or if the key sense wire is needed.

© 2008 Directed Electronics. All rights reserved.

➤ Door lock wire diagrams

> **Important:** Depending on the vehicle, the door locks may be controlled by an optional data bus expansion module. If so, no door lock interface wiring is required.

There are eight different types of door lock systems (Type A - H).

Type A: Three-wire (+) pulse controlling factory lock relays.

Type B: Three-wire (-) pulse controlling factory lock relays.

Type C: Direct-wired reversing-polarity switches. The switches are wired directly to the motors. This type of system has no factory relays.

Type D: Adding one or more aftermarket actuators. These include central locking systems without an actuator in the driver's door, but with factory actuators in all the other doors.

Type E: Electrically-activated vacuum systems.
Type F: One-wire system - cut to lock, ground to unlock.
This is a very rare system found mainly in early 90's imports and some newer Hyundais.

Type G: Positive (+) multiplex. One wire controls lock and unlock using resistor(s).

Type H: Negative (-) multiplex. Same as Type G system, but uses (-) pulse instead.

> **Important:** You can use a 456L door lock learn module for Type G and H, instead of relays and resistors. For additional information and wiring diagrams see Document 1041 at **www.directechs.com** under the Resource tab.

© 2008 Directed Electronics. All rights reserved.

Neutral safety switch interface

Some vehicles do not have an electrical neutral safety switch. Instead, the vehicle has a mechanical neutral safety switch that physically interrupts the starter wire and is used when the vehicle is in any drive gear. If the remote start is interfaced before this switch, it will provide protection from starting in gear. However, some vehicles combine the column shift mechanism and the mechanical neutral safety switch into one mechanical part.

> **Important:** You must complete the remote start system installation before doing the following test. Ensure that the remote start system is functioning normally. This includes connecting to the brake as a shut-down.

➤ Testing the neutral safety switch

1. Make sure there is adequate clearance to the front and rear of the vehicle because it may move slightly.
2. Make sure the hood is closed and there are no remote start shut-downs active.
3. Set the emergency brake.
4. Turn the key to the "run" position, this will release the shifter.
5. Place the car in drive (D).
6. Place your foot directly over the brake pedal, but do not depress it. Be ready to step on the brake if the starter engages.
7. Activate the remote start system.
8. If the starter engages, immediately depress the brake to shut the remote start system down. If the starter does not engage, no additional safety system is required.
   If the starter engages and the vehicle is a General Motors product or Dodge Dakota pickup, you can find an alternative shut-down method to prevent the starter from engaging. Refer to **www.directechs.com** for Document 1008 under the Resource tab. If the vehicle is not a General Motors product or a Dodge Dakota pickup, please call Directed Electronics Technical Support for an alternative shut-down method. **Do not return the vehicle to the customer until this feature is properly installed!**

© 2008 Directed Electronics. All rights reserved.

Plug-in LED and valet/program switch

The LED and valet switch are incorporated into the control center the LED line will plug into the white 2-pin port and the Valet switch line will plug into the blue 2-pin port.

Note: Onboard LED and valet switch can be substituted with an optional outboard LED (P/N 8634 for Blue LED and 8633 for red LED) and an outboard valet switch (P/N 8631).

Bitwriter® interface - 3-pin black plug

The black 3-pin port is provided for programming the unit using the Bitwriter (p/n 998T). When using the Bitwriter, it is possible to configure any and all of the programmable functions as well as lock the Remote Control and System Features Learn Routines so that unauthorized users cannot change the configuration or program remote controls to the unit.

When the learn routines have previously been programmed using the Bitwriter, they may have been locked. Before proceeding with reprogramming the learn routines, they must be unlocked with the Bitwriter - this cannot be done manually with the Valet switch.

Note: Bitwriters require software v2.6. Bitwriters with date code of 6A or older require an IC upgrade (p/n 998M). Bitwriter 2 compatible. Some bitwriters with a date code of 6B do not require the IC upgrade refer to Tech Tip #1112 for more information. Bitwriter 2 compatible.

© 2008 Directed Electronics. All rights reserved.

Tachometer settings

➤ Virtual tach

To program Virtual Tach:

1. After the install is complete, remote start the car.
2. If the car does not start on the first attempt, let the remote start attempt again.
3. Once the car starts, let it run until the parking lights come on.
4. When the parking lights come on, shut off the remote start with the remote - that's it! Virtual Tach is programmed.

To reset Virtual Tach, go into the remote programming grid and choose option #4. Virtual Tach **cannot** be reset with the Bitwriter.

Note: Virtual Tach cannot be used in MTS mode.

Virtual Tach handles disengaging the starter motor during remote starting – it does not address over-rev. If the customer wants to have the over-rev protection capability, the tach wire must be connected. This may involve more installation shop charges than initially quoted.

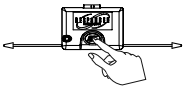
> **Important:** If the Virtual Tach mode over cranks or doesn't crank the vehicle long enough to start and run the car, use the Bitwriter to add or subtract the starter output time. You can adjust the output time in increments of 50mSec of the learned time using the Bitwriter.

© 2008 Directed Electronics. All rights reserved.

➤ Tach learning

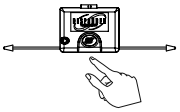
To learn the tach signal:

1. Start the vehicle with the key.



2. Within 5 seconds, press and hold the Valet/Program switch.

3. After 3 seconds the LED will light constant when the tach signal is learned.

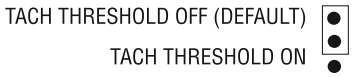


4. Release the Valet/Program switch.

© 2008 Directed Electronics. All rights reserved.

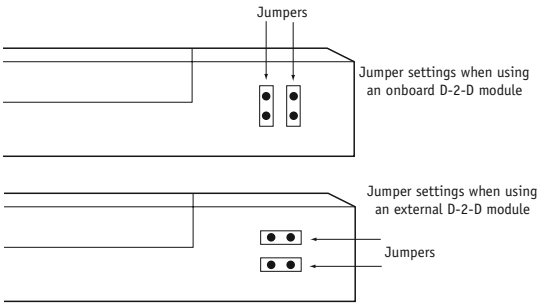
Tach threshold On/Off

In most cases, this jumper can be left in the Off position. Some new vehicles use less than 12 volts in their ignition systems. The unit may have trouble learning the tach signal in these vehicles. Changing the jumper to the On setting changes the trigger threshold of the digital tach circuit so that it will work with these type vehicles.



D2D Jumper settings

The system has the ability to work with a compatible module through the D2D lines. There are two settings: one for using an internal docking module, (p/n 400N) or an external module.



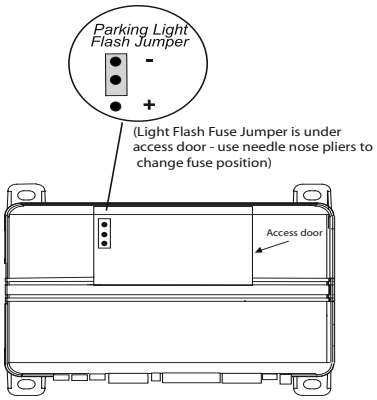
© 2008 Directed Electronics. All rights reserved.

Setting the light flash polarity

Light flash (+) / (-) polarity

The internal fuse is used to determine the light flash output. In the (+) position, the onboard relay will output (+)12V on the WHITE wire, H1/11. In the (-) position, the on-board relay will supply a (-) output When wiring into a multiplex circuit, you can replace the fuse with a resistor (paying attention to the polarity setting). (Refer to diagram on p. 16, H1/4 White/ Brown wire description).

Note: For parking light circuits that draw 10 amps or more, the internal jumper must be switched to a (-) light flash output. P/N 8617 or a standard automotive SPDT relay must be used on the H1/11 light flash output harness wire.



© 2008 Directed Electronics. All rights reserved.

Remote control Learn Routine™

The system comes with a 1-way and a 2-way remote control that are already programmed to the system. The system can store up to 4 different remote control codes in memory.

The remote uses a Supercode Protocol and requires setup before programming the system.

To enter the remote setup mode 2-way remote:

1. Make sure the keypad is unlocked.
2. Press and hold the f button on the remote for approximately 8 seconds , at 3 seconds ignore the car select indicator and continue to hold. The LC text displays Main Menu until the f button is released.
3. Release the f button. The LC text displays the remote setup options table.
4. Press the button to move down, and press the AUX to move up the Main Menu, one option per press.
5. When the Pair Remote menu option is displayed, press and hold the f button for 1 second. The remote emits 3 short beeps and the LC text displays "pair" confirming that the remote is ready to be programmed to the system.
6. Now enter the remote control learn routine using the control center (as described on the following page) and choose the *Auto learn standard configuration* function listed on the program grid.

To enter the remote setup mode 1-way remote:

1. Hold the f button on the remote until you hear it emit a long beep. The transmit LED comes on solid (approximately 8 seconds).
2. Press and hold the button until the remote beeps three times, and the amber Transmit LED lights up.
3. Next enter the remote control learn routine using the control center, and choose the function for “auto learn standard configuration” listed on the program grid.

© 2008 Directed Electronics. All rights reserved.

Note: You do not need to go through the setup for the other features in the menu.

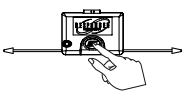
After entering the setup mode on the remote, use the following learn routine to add remote controls to the system.

The learn routine may be locked if previously programmed using the Bitwriter®. If the horn (if connected) generates one long honk when attempting to program the unit, the learn routine is locked and must be unlocked using the Bitwriter® before proceeding.

The Valet/Program switch, plugged into the blue port, is used for programming. This is a basic sequence to remember whenever programming this unit:

Key, Select, Press to transmit, then Release.

1. Insert the Key. Turn the ignition to the ON position. The heavy gauge pink wire must be connected.



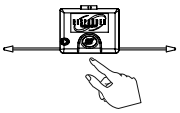
2. Select. Within 10 seconds, press and release the Program switch corresponding to the number of the desired function step listed in the following table.

Once you have selected the function step, press the switch once more and hold it. The LED flashes and the horn honks to confirm the selected functional step. Release the Program switch.

© 2008 Directed Electronics. All rights reserved.

Step	Function
1	Auto Learn Standard Configuration* (default). The auto learn configuration will automatically setup the remote button configuration. **Note:** Due to the Supercode protocol, you cannot change the configuration.
2	Delete remotes: This feature will erase all remotes from the memory of the security system. This is useful in cases when a customer's remote is lost or stolen. **Note:** This will not reset the programmed features of the system or reset the Virtual Tach setting.
3	Reset Features: This resets all the features of the system to the factory default settings. **Note:** This feature does not delete the remotes from the system or reset the Virtual Tach setting.
4	Virtual Tach Reset: Deletes all previously learned values for Virtual Tach, and on the next remote start sequence the unit will begin virtual tach initialization. **Note:** The "Zap" feature on the Bitwriter will not reset the Virtual tach setting.

3.Transmit. Press the 🔒 button on the remote control. The vehicle's horn honks to confirm that the code has been successfully programmed. It is not possible to teach a remote control button to the system more than once.



4. Release. Once the code is learned, you can advance from one function step to another by releasing the Valet/Program switch and tapping it to advance function steps and then holding it.

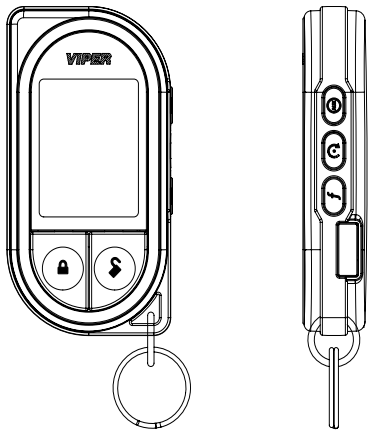
Learn Routine is exited if:

- The ignition is turned off
- The program switch is pressed too many times
- More than 30 seconds elapses between steps

© 2008 Directed Electronics. All rights reserved.

Remote control configuration

➤ Responder LC 2-way



Note: The 1-way remote only has the transmit LED and will not give any confirmation tones.

The remote control buttons that operate the features of the remote start system are described below. The buttons will operate in this configuration when the remote control is programmed using the Step 1 Auto-learn routine.

© 2008 Directed Electronics. All rights reserved.

For more information about the remote control functions, see the Owners Guide.

Level / Button	Direct Access	f x 1	f x 2	f x 3	f x 4
	Lock	Silent Lock			
	Unlock	Silent Unlock	Valet Mode	Car Finder	
	Remote Start	Reset Runtime	Timer Mode	Smart Start	Rear Defogger
	Trunk Release	AUX 1	AUX 2	AUX 3	
f	Function Shift	Cabin Temperature request (2-way only)	Runtime Check (2-way only)		

Important: To access Cabin Temperature request and Runtime Check, press the f button the specified amount of times, and then hold.

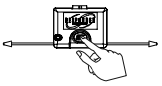
© 2008 Directed Electronics. All rights reserved.

System features learn routine

The System Features Learn Routine dictates how the unit operates. It is possible to access and change any of the feature settings using the Valet/program switch. However, this process can be simplified by using the Bitwriter®. Any of the settings can be changed and then assigned to one of four remote controls. This feature is called Owner Recognition. Each time that particular remote control is used to disarm the system, the assigned feature settings will be recalled. Owner Recognition is only possible when programming the unit via the Bitwriter®.

If programming with the Bitwriter®, the learn routine can be locked or unlocked. If the learn routine has previously been locked, it must be unlocked with Bitwriter® - this cannot be done manually with the Valet switch.

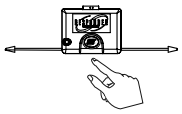
1. Ignition. Turn the ignition on, then off.
(The heavy gauge PINK wire must be connected.)



2. Select a Menu. Press and HOLD the Valet/Program switch. (The Valet/Program switch must be plugged into the blue port.) After three seconds the LED flashes and the horn honks one-time, indicating entry to the Basic Features Menu. If this is the menu you want, release the button and go on to Step 3.

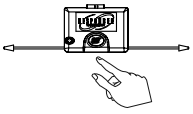
If the button is not released, the program jumps to the next menu and the horn honks twice. There are three possible menus. Select the menu you want, then release the Valet/Program switch.

© 2008 Directed Electronics. All rights reserved.



3. Select a Feature. Press and release the Valet/ Program switch the number of times corresponding to the feature you wish to change. For example, to access the third feature, press and release 3 times. Then press the button once more and HOLD it. The horn honks the number of times equal to the feature you have accessed. You can now release the Valet/program switch.

4. Program the Feature. You can toggle the feature on and off using the remote control. Press the button to lock the system to select options in ascending order. Press the button that unlocks the system, to select options in descending order.
Press the Remote Start button to reset a feature to the factory default.



5. After selecting the feature you want, release the Valet/program switch.

Note: Some features have more than two possible settings. Pressing or will toggle through the two-honk and higher settings.

Once a feature is programmed:

- Other features can be programmed within the same menu
- Another menu can be selected
- The learn routine can be exited if programming is complete

© 2008 Directed Electronics. All rights reserved.

To access another feature in the same menu:

1. Press and release the Valet/Program switch the number of times necessary to advance from the feature you just programmed to the next one you want to program.
2. Then press the Valet/Program switch once more and hold it.

For example, if you just programmed the third feature in the menu and you want to program the seventh feature in the menu, press and release the Valet/Program switch four times and then press it once more and hold it. The LED flashes and the horn honks seven times to confirm access to the seventh feature.

To select another menu:

1. Press and hold the Valet/Program switch.
2. After three seconds, the unit advances to the next menu, the LED flashes and the horn honks, indicating which menu has been accessed.

If you just programmed features in the first menu and you want to program a feature in the third menu, press and hold the Valet/Program switch. After three seconds the LED flashes and the horn honks twice indicating access to the second menu. Continue to hold the button, three seconds later the LED flashes and the horn honks three times indicating access to the third menu.

Features in the third menu are then programmable following steps 4 through 6 of the System Features Learn Routine procedure.

The learn routine is exited if any of the following occurs:

- The ignition is turned On
- There is no activity for 30 seconds
- The Valet/Program switch is pressed too many times

© 2008 Directed Electronics. All rights reserved.

Feature menus

The default settings are indicated in bold type. The numbers in parenthese indicate the number of times the LED on the control center flashes.

➤ Menu 1 - Keyless entry

Menu Item	Feature	Opt. 1	Opt. 2	Opt. 3	Opt.4	Opt. 5+
1	System Locking	**Active locking**	Passive locking	Auto relocking		
2	Panic Mode	**On**	Ign Off only	Off		
3	Horn function	**Confirmation honk (20mS) & panic**	Confirmation honk (30mS) & panic	Confirmation honk (40mS) & panic	Confirmation honk (50mS) & panic	Confirmation honks Off, Panic only
4	Ign-controlled locks	**No Ign-locking**	Lock & Unlock	Lock Only	Unlock Only	
5	DoorLock Pulses	**Single**	Double Unlock Only	Double Lock Only	Double Lock & Unlock	
6	DoorLock Output Duration	**0.8sec**	3.5 sec	0.4 sec		
7	2nd Unlock	**No 2nd unlock**	2nd unlock on Ign-control after first unlock	2nd unlock on Ign-control with first unlock		
8	Comfort Closure	**No Comfort Closure**	Comfort Closure 1	Comfort Closure 2		
9	Hood Trigger Type	**Normally Open**	Normally closed			

© 2008 Directed Electronics. All rights reserved.

➤ Menu 2 - Convenience

Menu Item	Feature	Opt. 1	Opt. 2	Opt. 3	Opt.4	Opt. 5+
1	One-time Bypass	**On**	Off			
2	Valet Switch Pulse Count	**1**	2	3	4	5
3	Door ajar Error honk	**On**	Off			
4	Ign-controlled Dome light	**On**	Off			
5	OEM Alarm Disarm w/ Trunk Release	**On**	Off			
6	OEM Alarm Disarm Output	**With Unlock**	Before Unlock	Remote Start Only		
7	OEM Alarm Disarm Pulses	**1**	2			
8	Aux 1 Output type	**Validity**	Latch	Latch/reset/ ign	Timed 30 secs	Off
9	Aux 1 Linking	**No Linking**	Link to Arm	Link to Disarm	Link to Arm/ disarm	Link to Remote Start only
10	Aux 2 Output type	**Validity**	Latch	Latch reset/ Ign	Timed 30 secs	Off
11	Aux 2 Linking	**No Linking**	Link to Arm	Link to Disarm	Link to Arm/ Disarm	Link to Remote Start only
12	Aux 3 Output type	**Validity**	Latch	Latch reset/ Ign	Timed 30 secs	Off
13	Aux 3 Linking	**No Linking**	Link to Arm	Link to Disarm	Link to Arm/ Disarm	Smart Key Control (Link to Remote Start Off)

© 2008 Directed Electronics. All rights reserved.

➤ Menu 3 - Remote start

Menu Item	Feature	Opt. 1	Opt. 2	Opt. 3	Opt.4	Opt. 5
1	Transmission Mode	**Manual**	Automatic			
2	Engine Checking Mode	**Virtual Tach**	Voltage	Off	Tachometer	
3	Cranking Time	**0.6 sec**	0.8 sec	1.0 sec	1.2 sec	1.4 (5)/1.6(6)/ 1.8 (7) 2.0(8)4.0(9)
4	Remote Start Runtime	**12 min**	24 min	60 min		
5	Activation Pulse Count	**1**	2			
6	Turbo Mode	**No Turbo Mode**	On 1 min	On 3 min	On 5 min	On 10 min
7	Timer Mode Runtime	**12 min**	3 min	6 min	9 min	
8	Flex Relay Function	**Ignition 2**	Accessory 2	Starter 2		
9	Diesel Start Delay	**Wait-to Start input**	Timed 15 sec	Timed 30 sec	Timed 45 sec	
10	Accessory during Diesel Start Delay	**On**	Off			
11	Status 2 Output	**Status**	Latch Rear Defogger	Pulse Rear Defogger		
12	Parking Light Output	**Constant**	Pulsed	Off		
13	Anti-grind Output	**On**	Off			
14	Tach Mode Starter Release	**Normal**	Increase	Decrease		
15	Vehicle temp auto report	**Off**	On			

© 2008 Directed Electronics. All rights reserved.

Feature descriptions

The features of the system are described below. Features that have additional settings that can be selected only when programming with the Bitwriter® are indicated by the following icon:

> **Important:** Default settings are in bold. The numbers in parentheses indicate the number of times the LED on the control center flashes.

➤ Menu 1 - Keyless entry

1-1 Active/Passive Locking/Auto-relocking: When active locking (1) is selected, the system only locks when the transmitter is used. When set to passive (2) the system automatically locks 30-seconds after the last door is closed. To alert the consumer of passive locking, the horn honks 20-seconds after the door is closed. This provides the consumer with an audible warning prior to the system actually locking. At the 30-second mark the system locks, but without the horn honk.

When Auto re-locking (3) is On, the system re-locks the doors 30 seconds after the system is unlocked when using the remote, and the doors on the vehicle have not been opened. If a door is opened when the re-lock timer is active, the auto re-lock feature is defeated until the system sees another unlock command from the remote.

> **Important:** The optional door input must be connected for this feature to work.

1-2 Panic On: (1 LED flash) This feature controls whether or not the panic mode is available with the ignition on. In some states there are laws prohibiting a horn continually sounding in a moving vehicle. This feature makes the system compliant with these regulations. The LED flashes twice (2) to indicate Panic with ignition Off. When Panic is Off, the LED flashes (3)

© 2008 Directed Electronics. All rights reserved.

1-3, Horn Function: Turns On/Off the confirmation honks when locking/unlocking. Use it to change the output pulse duration for vehicles that require a longer pulse for the horn to honk. Confirmation honks ON (20mS) & panic, (1) Confirmation honk (30mS) & panic, (2) Confirmation honk (40mS) & panic (3) Confirmation honk (50mS) & panic (4) Confirmation honks OFF, panic only (5). When choosing panic only; the horn will not sound when locking or unlocking, only when the panic feature is used.

1-4 Ignition Locks Off: (1) When turned Off the system does not lock/unlock the doors when the ignition is turned on. (2) Lock and Unlock. The doors lock three seconds after the vehicles doors are closed when the ignition is turned On, and unlock when the ignition is turned Off. (3) Lock: Locks the doors three seconds after the ignition is turned On and the vehicles doors are closed. 4) Unlock: Unlocks the doors when the ignition is turned off.

> **Important:** The optional door input must be connected for the ignition controlled lock feature to work.

1-5 Single Pulse Lock/Unlock(1): The system sends out a single pulse when locking and unlocking. (2) Double-pulse unlock sends out 2 pulses when unlocking. (3) Double-pulse lock sends out 2 pulses when locking. (4) Double-pulse lock/unlock sends out 2 pulses when locking and unlocking.

1-6 0.8 sec Door Lock Pulse (1)Duration: The default setting is 0.8 second door lock pulses. Some European vehicles, such as Mercedes-Benz and Audi, require longer lock and unlock pulses to operate the vacuum pump. Programming the system to provide 3.5 second (2) pulses, accommodates the door lock interface in these vehicles. (See door lock connections section for wiring information regarding Type E door locks interfacing. The 0.4 second (3) pulse is required on some vehicles where the lock wires can also control the windows, and the 0.8 second pulse causes the windows to open/close when locking or unlocking.

1-7 No 2nd Unlock Output (1): The second unlock output is defeated at all times. (2) 2nd unlock On with ignition control; after first unlock, turns on the 2nd unlock output, and unlocks the passengers doors after the driver's door is unlocked with ignition controlled locks. (3) 2nd unlock On with ignition control, first unlock turns On the 2nd unlock output, and unlocks the passengers doors at the same time the driver door is unlocked with ignition controlled locks.

© 2008 Directed Electronics. All rights reserved.

1-8 Comfort Closure Off(1): The system can be programmed to close the windows when the system is locked. If programmed ON, the lock output provides a 20 second pulse when the system is locked. The output will be cancelled if the button is pressed. In the Off setting this functions does not work.
(2) Comfort closure 1 - Activates the 20 second timer after the door lock pulse.
(3) Comfort Closure 2 - Activates the 20 second timer with the door lock pulse.

To test if the car has Comfort Closure:

1. Insert the key into the drivers door key cylinder.
2. Turn the key to the lock position and hold for about 10 seconds. If Comfort closure is available, the windows (and in some cars the sunroof) will close.

Note: Some cars require that you turn the key once, release it, and then turn and hold into the lock position.

> **Important:** Comfort closure can only be used on cars that have the capability of closing the windows (and on some cars the sunroof as well) with the key cylinder in the door.

1-9 Hood Trigger (Normally Open): Hood trigger (normally closed). To program the unit for either a normally open (rests open, or at 12v when the hood is closed) or a normally closed (rests at ground when the hood is closed) pin switch.

➤ Menu 2 - Convenience

2-1 One time bypass OFF: When programmed Off (1) the unit does not passively lock for one cycle when turning the ignition On and Off within 3 seconds. When going through this procedure the horn honks once indicating that One Time Bypass has been activated. One time bypass On (2), the system passively locks the vehicle 30 seconds after the ignition is turned off, and the door has been opened and closed.

© 2008 Directed Electronics. All rights reserved.

2-2 Valet switch pulse count, 1 pulse. Optional starter kill emergency override from valet, 2 - 5 pulses. The system can be programmed to count the number of presses of the valet switch before disabling the optional kill. The factory default setting is one pulse. The unit can also be set for two to five pulses.

2-3 Door trigger error notification: Door trigger error honk Off. When On (1) , this feature controls the error honk that is generated if the system is locked with the door trigger active. This is useful in vehicles with a long dome light delay after the door is closed. If the system is locked before the dome light turns Off, the system generates the door trigger error notification. If this error notification is not desired, use this feature to disable the door open error notification. If the error notification is turned Off, (2), no bypass horn is generated, even if a door is accidentally left open.

> Important: The optional door input has to be connected for this feature to work.

2-4 Ignition Controlled Dome Light Supervision On: If turned on, (1) the system will turn on the dome light for 60 seconds when the ignition is turned off. The optional dome light supervision feature must be installed as described in the Wire Connection Guide. Use the two-honk setting for: Ignition controlled dome light Off.

2-5 FAD w/Trunk Release ON: FAD w/Trunk Release OFF. In the default setting the factory alarm disarm output will disarm the factory alarm system any time the button controlling the trunk release output is pressed.

2-6 Factory Alarm Disarm-With Unlock, Before Unlock, Remote Start Only: In the default setting the factory alarm disarm output will disarm the factory alarm system any time the button controlling Unlock or Remote Start is pressed. The "Before Unlock" output will disarm the factory alarm before the unlock output activates and when remote start is activated. The "Remote Start Only" will disarm the factory alarm only when the remote start is activated.

2-7 FAD 1 pulse: FAD 2 pulses. This setting determines how many pulses the security system will output on the Factory alarm disarm wire.

© 2008 Directed Electronics. All rights reserved.

2-8 Aux 1 Validity (1) Latched (2), Latch reset w/ignition (3), 30-sec. timed (4)

- Validity: Output that sends a signal as long as the transmission is received.
- Latched: Output that sends a signal when the Channel 1 button is pressed and continues until the same button is pressed again.
- Latched, reset with ignition: Similar to the latched output, it turns ON the first time the Aux 1 button is pressed and turns OFF the next the same button is pressed. This output type additionally stops and resets whenever the ignition is turned ON, and then OFF.
- 30-second timed: Output that sends a continuous signal for 30 seconds.
- Off: Output is disabled.

Note: All auxiliary channel timed outputs can be programmed using the Bitwriter® (1-90 seconds)

2-9 Aux 1 Linking, None (1) Lock (2) Unlock (3) Lock/Unlock (4) Remote Start (5). When programming to Validity or timed output this can be programmed to activate when locking or unlocking (or remote start) with the transmitter.

Note: Aux linking gives you option to have the auxiliary wire activate when locking, unlocking, locking and unlocking or with remote start.

2-10 Aux 2 Validity (1) Latched (2), Latch reset w/ignition (3), 30-sec. timed, (4) Output, (5) Off: Aux 2 can be programmed for these output configurations. The unit is set to the default validity output. To change the configuration use the two-honk setting to toggle through the different configurations. Refer to feature 2-8 for additional details

.

2-11 Aux 2 Linking None (1) Arm (2) Disarm (3) Arm/Disarm (4) Remote Start (5). Refer to feature 2-9 for additional details.

2-12 Aux 3 Validity (1) Latched (2), Latch reset w/ignition (3), 30 -sec. timed, (4) Output, (5) Off: Aux 3 can be programmed for these output configurations. The unit is set to the default validity output. To change the configuration use the two-honk setting to toggle through the different configurations. Refer to feature 2-8 for additional details.

© 2008 Directed Electronics. All rights reserved.

2-13 Aux 3 Linking None (1) Lock (2) Unlock (3) Lock/Unlock (4) Smart key control (link to remote start Off. (5). When aux 3 is programmed to Smart Key control, this wire outputs a 800ms pulse when the Remote Start is shut Off.
The system also monitors the door trigger input. When the door is opened during the remote start runtime, the remote start shuts down and this wire outputs the 800ms pulse.

> **Important:** This wire is connected to the pushbutton wire that start and stops the car. It pulses the wire at the button to shut off the car when the remote start is deactivated.

➤ Menu 3 - Remote start

3-1 Manual Transmission Mode: This is the default setting. The two-honk setting is used for Automatic transmission mode. In the default setting the remote start unit is programmed to look for a shutdown procedure to activate the remote start.

> **Important:** The optional door input has to be connected for manual transmission start to work.

3-2 Engine Checking Virtual Tach: (1) When set to "virtual tach" the remote start will monitor the cranking voltage of the vehicle and set that voltage as a reference point. Fifteen seconds after the crank output sequence the remote start checks the voltage again to determine if the vehicle is running.

When set to voltage (2), the unit cranks the starter for the programmed time and then senses that the engine is running by detecting an increase in voltage. If programmed OFF (3) the vehicle cranks for the programmed time and does not verify with tach or any voltage setting that the car is running. If the vehicle fails to start, the ignition will stay on for the run duration. Using tach or either voltage settings is recommended.

When set to Tachometer (4), the unit references the learned tach signal to disengage the starter. In addition it will monitor the RPM and shut down if the engine RPM is too high or too low.

> **Important:** The tach wire must be connected and programmed for the manual transmission mode to work.

© 2008 Directed Electronics. All rights reserved.

3-3 Crank Time 0.6 (1) 0.8 (2) 1.0 (3) 1.2 (4) 1.4 (5) 1.6 (6) 1.8 (7) 2.0 (8) 4.0 (9) SECONDS: If the unit is programmed for no engine checking or voltage sense, the crank time must be set to the appropriate duration. The default setting is 0.6 second and the LED will flash once. If a different crank time is desired, toggle through the higher settings by using the two-honk settings.

3-4 Run Time 12 (1), 24 (2) 60 (3) MINUTES: Selects the time in minutes that the system will operate the engine until the system "times out". The system may be shut down using the remote or any of the shutdowns at any time. Using the Bitwriter®, the run time can be programmed for any duration from 1-60 minutes.

3-5 Activation Pulse One: This allows the system to use 1 or 2 pulses to activate the remote start sequence. The default setting is 1-pulse.
Note: This setting affects both the input wire and the remote control.

3-6 Turbo Mode: The factory default is OFF (1). On1 min (2), On 3 min (3) On 5 min (4) On 10 min (5): In the Off setting the turbo mode does not function. In the On and timed setting, the remote start can be used as a turbo timer. The car remains running for the programmed runtime, and the ignition is turned Off.

> **Important:** For this feature to work the tachometer wire on the remote start needs to be connected and programmed.

3-7 Timer Mode Run Time—12min (1), This is the default setting. Selects the time in minutes that the system will operate the engine until the system "times out" when the remote start activates in timer mode. Use the two-honk setting for 3 min(2), 6 min (3), 9 min (4) : This is the maximum operation period and the system may be shut down using a shutdown at any time. Using the Bitwriter®, the run time can be programmed for any duration from 1-16 minutes.

3-8 Flex Relay Function: Ignition 2 (1) In the factory setting, the flex relay will function the same as the pink ignition 1 wire, in accessory setting the flex relay will function the same as the Orange accessory 1 wire, in starter setting the flex relay will function the same as the purple starter 1 wire.

© 2008 Directed Electronics. All rights reserved.

3-9 Diesel Timer—Wait-To-Start Input - Timed 15, 30, 45 SECONDS: Default is the "Wait-to-Start" input control wire, or programmable to ignore the input control wire by a delay of 15 (2), 30 (3), or 45(3) seconds. This feature can also be optionally programmed with the Bitwriter®, with a delay from 1 to 90 seconds.

3-10 Accessory State During Wait-To-Start On: This feature will allow the selection of the accessory output to be ON or OFF during wait-to-start. Use the two-honk setting for OFF.

3-11 2nd Status Output: Normal: This feature will allow selection of status output or a rear defogger mode that turns on ten seconds after the vehicle has started if the vehicle interior temperature is below 55 degrees F. The defogger mode has two selections, latched, the LED will flash twice, or pulsed, the LED will flash three times. Latched mode will only stay on for 10 minutes.

Note: When the defogger mode is on, the output will always be active and can be turned on independently with the remote for a one-time activation. (See the Remote Functions table.)

3-12 Parking Lights Constant: In the default setting, the parking lights (if connected) will come on solid during the remote start runtime. In the two - flash setting the parking lights will flash during the remote start runtime. In the OFF setting, the parking lights will not come ON or flash, when the vehicle is remote started.

3-13 Anti-Grind On: With the anti-grind On (default) the ground-when-armed output is active during remote start operation. This activates the optional starter kill relay and prevents the customer from re-cranking the car with the key, when doing key takeover. If accessories such as a voice module or window module are added to the unit, it may be necessary to use the two-honk setting to program this feature OFF.

3-14 Tach Mode Starter Release: Normal: Use the two-honk setting to increase time by 15% of the original tach programmed time. The LED will flash twice (2). To decrease by 15% of the original programmed time, the LED will flash three (3) times.

© 2008 Directed Electronics. All rights reserved.

3-15 Vehicle temperature auto report ON or OFF. The default setting is OFF. When programmed ON the main unit will store the interior temperature of the vehicle in its temporary memory. When the vehicle's interior temperature changes 1 degree celsius, the main unit automatically sends the interior temperature message to the remote. The LCD text area displays the current temperature.

➤ Bitwriter®

The Bitwriter® has the ability to fine tune certain features of the system. These features and the adjustments that may be programmed are described in the table below.

Feature	Default setting	Optional settings
Aux/trunk icon type	Trunk	Window, sunroof, audio, lights, left slider dr, right slider dr, rear hatch.
Aux 1 timed output	30 seconds	1-90 seconds
Aux 1icon type	None	Trunk, window, sunroof, audio, lights, left slider dr, right slider dr, rear hatch, timed, latched, pulsed
Aux 2 timed output	30 seconds	1-90 seconds
Aux 2 icon type	None	Trunk, window, sunroof, audio, lights, left slider dr, right slider dr, rear hatch, timed, latched, pulsed
Aux 3 timed output	30 seconds	1-90 seconds
Aux 3 icon type	None	Trunk, window, sunroof, audio, lights, left slider dr, right slider dr, rear hatch, timed, latched, pulsed
Diesel start timer	15 seconds	1-90 seconds
Timer mode run time	12 minutes	1-16 minutes
Timer mode starts	6 starts	1/2/3/4/**6**/8/10/12/14/16/18 20/22/24 (Starts)
Timer mode intervals	3 hours	1/2/**3**/4/6/8/10/12/14/16/18/ 20/22/24 (Hours)

© 2008 Directed Electronics. All rights reserved.

Feature	Default setting	Optional settings
Smart start low temp	0 (F)	OFF/-20/-10/**0**/10/20/30/40/50/60/70 (F)
Smart start high temp	100 (F)	OFF/40/50/60/70/80/90/**100**/110/120/130 (F)
Smart start low battery	10.5 volts	OFF/12.5/12/11.5/11/**10.5**/10/9.5/9 volts
Tach mode starter release	10 (normal)	0/1/2/3/4/5/6/7/8/9/**10**/11/12/13/14/15/16/17/18/19/20
Feature programming	Unlocked	Locked
Virtual tach fine tune	Not initialized	0 to 1 second in 50ms increments.
Transmitter programming	Unlocked	Locked
Remote start runtime	12 minutes	1-60 minutes

Additional system features

For information about Valet Mode, Remote starting the vehicle, Manual Transmission start and Timer Mode please consult the Owner's Guide (see Using the system and Remote start sections) on the web at **www.directechs.com.**

© 2008 Directed Electronics. All rights reserved.

Shutdown diagnostics

To perform shutdown diagnostics:

1. With the ignition OFF, press and hold the Valet/Program switch.
2. Turn the ignition ON and then back OFF while holding the Valet/Program switch.
3. Release the Valet/Program switch.
4. Press and release the Valet/Program switch. The LED flashes to report the last shutdown for one minute or until the ignition is turned on, as shown in the following table:

LED Flashes	Shutdown mode
1	Runtime expired
2	Over-rev shutdown
3	Low or no RPM
4	Transmitter shutdown (or optional pushbutton)
5	(+) Brake shutdown
6	(-) Hood shutdown
7	Timer mode/Turbo mode/Manual mode error *
8	Neutral safety shutdown
9	Low battery (voltage mode)
10	————————
11	Wait-to-start input timed out

* Timer mode error: Ignition is on or shutdown input is active when activating timer mode.
Turbo mode error: Turbo mode is programmed off, engine is not on or shutdown input is active.
Manual mode error: MTS mode not enabled.

© 2008 Directed Electronics. All rights reserved.

Remote starting diagnostics

When the remote start function is activated and the 2-way remote emits an error tone, counting the number of parking light flashes, provides information about the cause of the no-start situation.

Parking light flashes	
5	Brake wire is active
6	Hoodpin wire is active
7	Manual transmission mode is enabled and not initialized.
8	Neutral safety wire has no ground or the neutral safety switch is Off.

© 2008 Directed Electronics. All rights reserved.

Remote start safety check

Before vehicle reassembly, the remote system must be checked to ensure safe and trouble-free operation. The following test procedure must be used to verify proper installation and operation of the system. The installation must be completed before testing, including connection to the brake switch and hood switch.

1. Test the BRAKE shutdown circuit: With the vehicle in Park (P), activate the remote start system. Once the engine is running, press the brake pedal. The engine should shut down immediately. If the engine continues to run, check the brake circuit connection.
2. Test the HOOD PIN shutdown circuit: With the vehicle in Park (P), open the hood. Activate the remote start system. The vehicle should not start. If the starter engages, check your hood pin and connections.
3. Test the NEUTRAL SAFETY shutdown circuit.

> **Important:** Make sure there is adequate clearance to the front and rear of the vehicle before attempting this test.

4. Make sure the hood is closed and no other shutdown circuits are active.
5. Set the emergency brake.
6. Turn the ignition key to the run position but do not start the engine.
7. Put the vehicle in Drive (D).
8. Put your foot over the brake pedal but do not press down on it. Be ready to step on the brake to shutdown the remote start system.
9. Activate the remote start system.

- If the starter engages, immediately step on the brake to shut down the system. If it does engage, recheck the neutral safety input connection. The vehicle may use a mechanical neutral safety switch. (See H3/1 BLACK/WHITE neutral safety switch input in Remote Start Harness Wire Connection Guide section of this guide.)

- If the starter does not engage, the test is complete. Once the system passes the tests, the vehicle can be re-assembled and delivered. Do not the use the remote start system or finalize the installation if it fails any of the safety check tests.

© 2008 Directed Electronics. All rights reserved.

Troubleshooting

➤ Keyless entry system

- System will not passively lock until it is remotely locked and then unlocked:

Are the door inputs connected? Is the H1/6 blue wire connected to the door trigger wire in the vehicle? Either the H1/5 green or the H1/7 violet should be used instead. (See wiring diagrams.)

- The Valet/Program switch doesn't work.

Is it plugged into the correct socket? See Plug-In LED and Valet/Program Switch section of this guide.

- Status LED doesn't work.

Is it plugged in? (See Plug-In LED and Valet/Program Switch section of this guide.) Is the LED plugged into the correct socket?

- Door locks operate backwards.

This unit has easily-reversed lock/unlock outputs. Recheck wire connections to see if you have reversed these.

➤ Remote start

- The remote start will not activate

1. Check remote startup diagnostics to determine what may be the cause of the no start situation.
2. Check the harnesses and their connections. Make sure that the harnesses are completely plugged into the remote start module. Make sure there are good connections to the vehicle wiring.
3. Check voltage and fuses on the main 12-pin harness and on the heavy gauge remote start harness.

- The remote start will activate, but the starter never engages.

1. Check for voltage on the purple starter wire two seconds after the remote start becomes active. If there is voltage present, skip to Step 4. If there is not voltage present, advance to Step 2.
2. Check the 30A fuses.

© 2008 Directed Electronics. All rights reserved.

3. If the gray/black wait-to-start wire is detecting ground upon activation, the starter will not crank.
4. Make sure the purple starter wire is connected on the starter side of the optional starter kill/anti-grind relay.
5. Does the vehicle have an immobilizer? Some immobilizer systems will not allow the vehicle to crank if active.
6. Check connections. The heavy gauge remote start input wires on the heavy gauge 10-pin connector should have a solid connection. "T-taps" or "scotch locks" are not recommended for any high current heavy gauge wiring.

- The vehicle starts, but immediately dies.

1. Does the vehicle have an immobilizer? The vehicle's immobilizer will cut the fuel and/or spark during unauthorized starting attempts.
2. Is the remote start programmed for virtual tach voltage sense? If so, the crank time may not be set high enough. Voltage sense will not work on some vehicles.
3. Check diagnostics. Sometimes a shutdown will become active during cranking or just after cranking.

- The vehicle starts, but the starter keeps running.

1. Is the system programmed for engine checking off or virtual tach voltage sense? When programmed for either of these features, the engine cranks for the pre programmed crank time regardless of how long it takes for the vehicle to actually start. Adjust to a lower cranking time.
2. Was the Tach Learn successful? The LED must light solid and bright to indicate a successful learn.
3. Make sure that there is a tach signal at the purple/white tach input wire of the remote start. If there is not a tach signal, recheck the connection to the vehicle's tach wire and make sure the wire is not broken or shorted to ground leading to the remote start.

© 2008 Directed Electronics. All rights reserved.

- The vehicle will start, but will only run for 10 seconds.

1. Is the remote start programmed for voltage sense? If this does not work, a tach wire should be used.
2. Check shutdown diagnostics.

- The climate control system does not work while the unit is operating the vehicle.

Either the wrong accessory wire is being energized or more than one ignition or accessory wire must be energized in order to operate the climate control system.

- Manual Transmission Start diagnostics

When enabling MTS, if you get a failure notification from the remote or the vehicle fails to remain started when you shut off the key, check for following:

- Hood Open (gray wire)
- Foot Brake active (brown wire)
- No Parking Brake input-Black/white neutral safety wire not showing ground with parking brake set.
- Tach not hooked up or programmed
- Toggle switch not installed or not in the ON position.

© 2008 Directed Electronics. All rights reserved.

Designed and Engineered in the USA

Directed®
ELECTRONICS

N4702V 2008-08

Vista, CA 92081
www.directed.com
© 2008 Directed Electronics—All rights reserved

© 2008 Directed Electronics. All rights reserved.